

Chapter 2

TRENDS, ISSUES AND OPPORTUNITIES

INTRODUCTION

Information regarding existing conditions and historic trends with respect to the demographic and economic base, the natural environment, and the man-made environment is essential to the comprehensive planning process. An extensive database has been developed by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) pertaining to these and other aspects of the Southeastern Wisconsin Region, updating that database periodically. A major inventory update effort was carried out by SEWRPC in the early 2000's in support of the preparation of new land use and transportation plans and other elements of the comprehensive plan for the Region, including Waukesha County and its municipalities. This chapter presents a summary of the results of that inventory update pertaining to the population, land use, water supply, the natural resource base and the agricultural resource base.

Much of the demographic data in this chapter is from the U.S. Bureau of the Census. This data is collected every ten years and is derived from both short and long form questionnaires. The short form provides a complete count of all persons living in the United States along with over 300 tables with counts and cross tabulations of race, ethnicity, gender, and age data. The long form is sent to 1 out of every 6 households in the United States. It provides sample data for topics related to education, housing, income, and other social and economic issues.

DEMOGRAPHIC AND ECONOMIC BASE

Population Growth by County

In 1930, Dodge and Waukesha County each had approximately 52,000 residents (Table II-1). Waukesha County began to experience significant population growth in the 1950s and experienced a population boom since 1940 that resulted in population increases per decade ranging from 23,000 people to 73,000 people (Table II-1). From 1960 to 2005 the county population more than doubled increasing from 158,249 to 377,348 (Table II-1). All of the counties surrounding Waukesha experienced smaller gains in total population since 1960 with the exception of a population decline in Milwaukee County. Between 1970 and 2005, Milwaukee County declined by 115,254 people, as population, business, and industry migrated from the City of Milwaukee.

Waukesha County Community Population Trends

Between 1970 and 1980 the majority of the county's growth in population occurred in cities and towns. In fact, 46 percent took place in cities, 44 percent in towns, and only 10 percent in villages. Between 1990 and 2000 the growth in cities remained the same (46 percent) with a more even distribution of growth between villages (31 percent) and towns (23 percent). In 2005, an estimated 20 percent of the total county population lived in towns (75,626 people), 24 percent resided in villages (91,157 people) and 56 percent were residents of cities (210,565).

The most significant population growth in communities took place in the City of Waukesha where the population increased by 27,915 people since 1970 (Table II-2). The Village of Sussex had the greatest increase in population (7,003 people) for any village within the county from 1970 to 2005. The Town of Mukwonago experienced the largest population growth of any town gaining 5,552 people from 1970 to 2005 (Table II-2).

Components of Population Change

Population change can be attributed to natural increase and net migration. Natural increase is the balance between births and deaths in an area over a given period of time; it can be measured directly from historical records on the number of births and deaths for an area. Net migration is the balance between migration to and from an area over a given period of time; as a practical matter, net migration is often determined as a derived number, obtained by subtracting natural increase from total population change for the time period concerned. Of the total population increase of 56,052 persons in the County between 1990 and 2000, 18,582 can be attributed to natural increase; the balance of 37,470 persons can be attributed to net in-migration. Table II-2 illustrates that the level of natural increase in the County has been relatively stable since the 1970's.

Table II-1

SELECTED COUNTY POPULATION GROWTH TRENDS: 1840-2005

Year \ County	Dodge County	Jefferson County	Milwaukee County	Racine County	Walworth County	Washington County	Waukesha County
1840	67	914	5,605	3,475	2,611	343	N/A
1850	19,138	15,317	31,077	14,973	17,862	19,485	19,558
1860	42,818	30,438	62,518	21,360	26,496	23,622	26,831
1870	47,035	34,050	89,936	26,742	25,992	28,274	28,258
1880	45,931	32,155	138,523	30,921	26,249	33,270	28,957
1890	44,984	33,530	236,101	36,268	27,802	35,229	33,270
1900	46,631	34,789	330,017	45,644	20,259	23,589	35,229
1910	47,436	34,606	433,187	57,424	29,614	23,784	37,100
1920	49,742	35,022	539,449	78,961	29,327	25,713	42,612
1930	52,092	36,785	725,263	90,217	31,058	26,551	52,358
1940	54,280	38,868	766,885	94,047	33,103	28,430	62,744
1950	57,611	43,069	871,047	109,585	41,584	33,902	85,901
1960	63,170	50,094	1,036,041	141,781	52,368	46,119	158,249
1970	69,004	60,060	1,054,249	170,838	63,444	63,829	231,338
1980	75,064	66,152	964,988	173,132	71,507	84,848	280,203
1990	76,559	67,783	959,275	175,034	75,000	95,328	304,715
2000	85,897	75,784	940,164	188,831	91,996	117,493	360,767
2005	88,748	79,188	938,995	193,239	98,496	125,940	377,348

Source: United States Bureau of the Census and the Wisconsin Department of Administration.

Table II-2

POPULATION GROWTH BY COMMUNITY IN WAUKESHA COUNTY: 1970-2005

Community	1970	1980	1990	2000	2005
Town of Brookfield	4,303	4,364	4,232	6,390	6,379
Town of Delafield	3,750	4,597	5,735	7,820	8,286
Town of Eagle	1,250	1,758	2,028	3,117	3,492
Town of Genesee	3,172	5,126	5,986	7,284	7,542
Town of Lisbon	4,709	8,352	8,277	9,359	9,733
Town of Merton	4,424	6,025	6,430	7,988	8,347
Town of Mukwonago	1,930	4,979	5,967	6,868	7,482
Town of Oconomowoc	6,010	7,340	7,323	7,451	7,882
Town of Ottawa	1,698	2,795	2,988	3,758	3,850
Town of Summit	3,809	4,050	4,003	4,999	5,178
Town of Vernon	2,857	6,372	7,549	7,227	7,455
Town of Waukesha	4,408	6,668	7,566	8,596	8,832
Village of Big Bend	1,148	1,345	1,299	1,278	1,285
Village of Butler	2,261	2,059	2,079	1,881	1,835
Village of Chenequa	642	532	601	583	586
Village of Dousman	451	1,153	1,277	1,548	1,808
Village of Eagle	745	1,008	1,182	1,707	1,772
Village of Elm Grove	7,201	6,735	6,261	6,249	6,234
Village of Hartland	2,763	5,559	6,906	7,905	8,365
Village of Lac La Belle	227	289	258	329	333
Village of Lannon	1,056	987	924	1,009	957
Village of Menomonee Falls	31,697	27,845	26,840	32,647	33,939
Village of Merton	646	1,045	1,199	1,926	2,376
Village of Mukwonago	2,367	4,014	4,464	6,162	6,506
Village of Nashotah	410	513	567	1,266	1,372
Village of North Prairie	669	938	1,322	1,571	1,855
Village of Oconomowoc Lake	599	524	493	564	637
Village of Pewaukee	3,271	4,637	5,287	8,170	8,969
Village of Sussex	2,758	3,482	5,039	8,828	9,761
Village of Wales	691	1,992	2,471	2,523	2,567
City of Brookfield	31,761	34,035	35,184	38,649	39,797
City of Delafield	3,182	4,083	5,347	6,472	6,876
City of Muskego	11,573	15,277	16,813	21,397	22,427
City of New Berlin	26,910	30,529	33,592	38,220	38,969
City of Oconomowoc	8,741	9,909	10,993	12,382	13,459
City of Pewaukee	7,551	8,922	9,621	11,783	12,625
City of Waukesha	39,665	50,365	56,894	64,825	67,580
Waukesha County	231,335	280,203	304,715	360,767	377,348

Note: The Town of Pewaukee was incorporated as the City of Pewaukee in 1999.

Source: U.S Bureau of the Census and the Wisconsin Department of Administration

Racial Composition

Almost 96 percent of residents in Waukesha County were White in 2000. However, the population of Waukesha County continues to grow more diverse. Between 1990 and 2000 the Hispanic population in the county nearly doubled from 5,448 to 9,503. The City of Waukesha experienced the largest growth in the number of Hispanics. Several neighborhood block groups within the City of Waukesha recorded populations that were over 25 percent Hispanic. Asians with nearly 5,400 people made up the third largest racial group within Waukesha County.

Household Trends

In addition to population, the number of households, or occupied housing units, is of importance in land use and public facility planning. Households directly influence the demand for urban land as well as the demand for transportation and other public facilities and services. A household includes all persons who occupy a housing unit-defined by the Census Bureau as a house, an apartment, a mobile home, a group of rooms, or a single-room that is occupied, or intended for occupancy, as separate living quarters.

Table II-3

OWNER VS. RENTER OCCUPIED UNITS IN WAUKESHA COUNTY MUNICIPALITIES: 2000

Community	Owner Occupied	Percent	Renter Occupied	Percent
Town of Brookfield	1,763	63.8	999	36.2
Town of Delafield	2,521	96.0	104	4.0
Town of Eagle	1,049	93.8	69	6.2
Town of Genesee	2,431	98.0	50	2.0
Town of Lisbon	3,104	96.5	114	3.5
Town of Merton	2,706	92.3	226	7.7
Town of Mukwonago	2,184	97.5	57	2.5
Town of Oconomowoc	2,765	90.8	280	9.2
Town of Ottawa	1,232	89.6	143	10.4
Town of Summit	1,747	91.8	157	8.2
Town of Vernon	2,380	99.0	25	1.0
Town of Waukesha	2,891	98.2	54	1.8
Village of Big Bend	448	98.0	9	2.0
Village of Butler	455	49.7	461	50.3
Village of Chenequa	193	86.5	30	13.5
Village of Dousman	315	54.8	260	45.2
Village of Eagle	529	89.4	63	10.6
Village of Elm Grove	2,444	95.6	112	4.4
Village of Hartland	1,746	58.2	1,256	41.8
Village of Lac La Belle	114	97.4	3	2.6
Village of Lannon	361	84.9	64	15.1
Village of Menomonee Falls	9,939	77.4	2,905	22.6
Village of Merton	558	94.4	33	5.6
Village of Mukwonago	1,516	63.4	876	36.6
Village of Nashotah	427	96.0	18	4.0
Village of North Prairie	455	85.7	76	14.3
Village of Oconomowoc Lake	185	88.9	23	11.1
Village of Pewaukee	2,330	64.1	1,305	35.9
Village of Sussex	2,179	65.8	1,131	34.2
Village of Wales	722	85.3	124	14.7
City of Brookfield	12,482	89.9	1,409	10.1
City of Delafield	1,694	66.4	859	33.6
City of Muskego	6,228	82.7	1,305	17.3
City of New Berlin	11,778	81.3	2,717	18.7
City of Oconomowoc	3,102	62.4	1,866	37.6
City of Pewaukee	3,826	84.0	727	16.0
City of Waukesha	14,508	56.5	11,155	43.5
Waukesha County Total	103,373	76.4	31,856	23.6

Source: U.S. Bureau of the Census

The number of households in the County increased by 29,239 households, or 28 percent, from 105,990 households in 1990 to 135,229 households in 2000.

This follows increases of 17,438 households during the 1980s, 26,617 households during the 1970s, 19,541 households during the 1960s, and 18,795 households during the 1950s. In 2000, slightly over 76 percent (103,373) of the total housing units were owner occupied in Waukesha County. This figure is consistent with neighboring counties with the exception of Milwaukee County which had 52 percent owner occupied homes in 2000. In Waukesha County municipalities, owner occupied housing ranges from 56.5 percent of total housing stock in the City of Waukesha to 99 percent in the Town of Vernon (Table II-3).

Household Size

In 2000, the average household size ranged from 2.05 in the Village of Butler to 3.26 in the Village of Merton (Table II-4). This figure continues to decline slightly in Waukesha County communities. From 1990 to 2000, the average household size declined in Waukesha County from 2.83 to 2.63. This trend is occurring on a regional, state, and national scale as families continue to become smaller. A growing population with a decreasing household size has implications for development of housing stock, demand for future water and sanitary sewer capacity, land use, and other utilities and community facilities. This trend is examined in more detail in the Housing and Utilities and Community Facilities chapters of this report.

Table II - 4

AVERAGE HOUSEHOLD SIZE IN WAUKESHA COUNTY: 2000

Community	Average Household Size	Community	Average Household Size	Community	Average Household Size
Town of Brookfield	2.29	Village of Big Bend	2.85	City of Brookfield	2.74
Town of Delafield	2.93	Village of Butler	2.05	City of Delafield	2.52
Town of Eagle	2.97	Village of Chenequa	2.61	City of Muskego	2.80
Town of Genesee	3.00	Village of Dousman	2.58	City of New Berlin	2.62
Town of Lisbon	2.90	Village of Eagle	2.88	City of Oconomowoc	2.40
Town of Merton	2.95	Village of Elm Grove	2.49	City of Pewaukee	2.57
Town of Mukwonago	3.14	Village of Hartland	2.63	City of Waukesha	2.43
Town of Oconomowoc	2.69	Village of Lac La Belle	2.81	Waukesha County	2.63
Town of Ottawa	2.73	Village of Lannon	2.37		
Town of Summit	2.76	Village of Menomonee Falls	2.52		
Town of Vernon	3.00	Village of Merton	3.26		
Town of Waukesha	2.97	Village of Mukwonago	2.54		
		Village of Nashotah	2.84		
		Village of North Prairie	2.96		
		Village of Oconomowoc Lake	2.71		
		Village of Pewaukee	2.19		
		Village of Sussex	2.67		
		Village of Wales	2.98		

Source: U.S. Bureau of the Census

Median Age

Waukesha County's median age is increasing. The median age in 1970 for the county was 27. The median age increased to 34 in 1990 and in 2000 reached 38.1. The City of Waukesha and villages of Hartland and Sussex had median ages well below the county's median age in 2000 (Table II-5). The towns of Brookfield, Ottawa, the villages of Chenequa, Elm Grove, Lac La Belle, and Oconomowoc Lake and the City of Brookfield were well above the county's median age. Ozaukee County was the only county in southeastern Wisconsin with a higher median age (38.9) than Waukesha County in 2000.

Age Composition

The 45 to 64 age and 65 and over age groups will continue to grow in number reflecting the aging of “baby boomers” (people born from 1946 through 1964). The population aged 25 to 44 will begin to decrease as baby boomers grow older and smaller age cohorts born in the 1970s move into this age group. This changing age composition will have implications for school districts, housing, labor, and transportation.

Table II - 5

**WAUKESHA COUNTY COMMUNITIES:
POPULATION BY AGE GROUP AND MEDIAN AGE: 2000**

	Under 5	5 to 14	15 to 24	25 to 44	45 to 64	65 and Over	Median Age
Town of Brookfield	368	815	494	1,582	1,551	1,580	44.4
Town of Delafield	488	1,347	1,136	1,933	2,403	513	38.6
Town of Eagle	226	532	326	1,030	799	204	36.9
Town of Genesee	437	1,289	865	2,101	2,121	471	38.7
Town of Lisbon	620	1,542	994	2,716	2,515	982	38.6
Town of Merton	483	1,553	828	2,279	2,159	686	38.3
Town of Mukwonago	426	1,316	856	2,128	1,839	303	36.7
Town of Oconomowoc	402	1,136	817	2,188	2,175	733	39.7
Town of Ottawa	206	596	409	999	1,118	430	41.1
Town of Summit	286	762	569	1,411	1,421	532	39.6
Town of Vernon	346	1,206	1,353	864	2,360	412	39.4
Town of Waukesha	488	1,555	1,020	2,415	2,405	713	38.8
Village of Big Bend	76	236	147	384	320	105	36.8
Village of Butler	82	214	186	580	377	442	40.9
Village of Chenequa	25	69	66	111	217	95	47.6
Village of Dousman	106	262	191	514	268	243	35.4
Village of Eagle	164	306	175	649	301	112	32.8
Village of Elm Grove	320	950	516	1,266	1,789	1,408	45.7
Village of Hartland	550	1,353	1,062	2,647	1,703	590	34.1
Village of Lac La Belle	22	44	24	81	122	36	43.9
Village of Lannon	52	125	114	301	281	136	39.8
Village of Menomonee Falls	2,161	4,709	3,053	9,950	7,650	5,124	39.2
Village of Merton	140	441	213	634	423	75	34.5
Village of Mukwonago	434	864	882	1,980	1,328	674	33.9
Village of Nashotah	91	233	126	366	337	113	37.8
Village of North Prairie	98	296	188	515	392	92	36.3
Village of Oconomowoc Lake	21	92	53	122	216	64	44.5
Village of Pewaukee	578	981	829	3,048	1,742	992	35.5
Village of Sussex	799	1,413	988	3,202	1,695	731	34.1
Village of Wales	151	443	356	732	736	105	37.3
City of Brookfield	2,072	6,311	3,740	8,957	10,760	6,808	42.5
City of Delafield	430	991	669	1,931	1,752	699	38.7
City of Muskego	1,431	1,482	2,232	6,737	5,332	1,781	37.5
City of New Berlin	2,275	5,425	4,222	11,083	10,372	4,843	39.8
City of Oconomowoc	781	1,716	1,757	2,253	2,686	2,092	38.0
City of Pewaukee	669	1,566	1,169	3,482	3,628	1,269	40.4
City of Waukesha	4,792	8,634	9,574	21,813	13,118	6,894	33.4
Waukesha County	23,096	54,805	41,587	107,439	90,406	43,434	38.1

Source: U.S. Bureau of the Census

Household Income

Waukesha County has a substantially higher median household income than adjacent counties. The median household income was \$62,839 in 2000 for Waukesha County (Table II-6). This figure was over 60 percent higher than the median household income in Milwaukee County. The median household income in Waukesha County communities (Table II-7) ranged from \$33,883 in the Village of Butler to over \$160,000 in the Village of Chenequa.

Table II-6
MEDIAN HOUSEHOLD INCOME BY SELECTED COUNTIES: 1999

County	Median Household Income
Milwaukee County	\$38,100
Dodge County	\$45,190
Walworth County	\$46,274
Jefferson County	\$46,901
Racine County	\$48,059
Washington County	\$57,033
Waukesha County	\$62,839

Source: U.S. Bureau of the Census

Table II-7
MEDIAN HOUSEHOLD INCOME BY WAUKESHA COUNTY COMMUNITIES: 1999

Community	Median Household Income
Town of Brookfield	\$55,417
Town of Delafield	\$98,779
Town of Eagle	\$69,071
Town of Genesee	\$78,740
Town of Lisbon	\$69,012
Town of Merton	\$78,937
Town of Mukwonago	\$75,067
Town of Oconomowoc	\$68,676
Town of Ottawa	\$69,493
Town of Summit	\$76,859
Town of Vernon	\$71,366
Town of Waukesha	\$73,984
Village of Big Bend	\$61,771
Village of Butler	\$38,333
Village of Chenequa	\$163,428
Village of Dousman	\$53,409
Village of Elm Grove	\$86,212
Village of Hartland	\$58,359
Village of Lac La Belle	\$100,000
Village of Lannon	\$44,375
Village of Menomonee Falls	\$57,952
Village of Merton	\$75,000
Village of Mukwonago	\$56,250
Village of Nashotah	\$82,949
Village of North Prairie	\$70,781
Village of Oconomowoc Lake	\$112,760
Village of Pewaukee	\$53,874
Village of Sussex	\$76,859
Village of Wales	\$75,000
City of Brookfield	\$76,225
City of Delafield	\$71,995
City of Muskego	\$64,247
City of New Berlin	\$67,576
City of Oconomowoc	\$51,250
City of Pewaukee	\$75,589
City of Waukesha	\$50,084
Waukesha County	\$62,839

Source: U.S. Bureau of the Census

Employment Trends

Waukesha County has continued to enhance its economy through new job creation. Waukesha County experienced a 43 percent growth in employment from 1990 to 2000 resulting in a net addition of 81,100 jobs. (Table II-8). Ozaukee County also recorded impressive employment growth during this period. Although, Milwaukee County has nearly three times as many jobs as Waukesha, it recorded only a 2 percent increase in jobs during the 1990s.

Waukesha County like the rest of Wisconsin has experienced a decline in manufacturing as a percent of total employment. Despite this fact, Waukesha County is still above the national average in manufacturing employment. Approximately 21 percent of all jobs in Waukesha County are in manufacturing. Nationally, only about 12 percent of all jobs are in manufacturing. Service employment has increased significantly over the last decade and now is the most important sector for jobs in the county accounting for 28 percent of all jobs within Waukesha County (Table II-9).

Table II-8

TOTAL EMPLOYMENT TRENDS BY SELECTED COUNTIES: 1990-2000

County	1990	2000	Number Increase In Employment 1990-2000	Percent Increase In Employment 1990-2000
Waukesha County	189,700	270,800	81,100	43%
Milwaukee County	609,800	624,600	14,800	2%
Ozaukee County	35,300	50,800	15,500	44%
Racine County	89,600	94,400	4,800	5%
Washington County	46,100	61,700	15,600	34%
Walworth County	39,900	51,800	11,900	30%

Source: U.S. Bureau of Economic Analysis and SEWRPC

Table II-9

WAUKESHA COUNTY EMPLOYMENT INDUSTRY TRENDS: 1990-2000

Waukesha County	1990	2000	1990-2000 Number Change in Employment	2000 Percent of Total Employment
Agriculture	1,191	1,011	-180	1%
Construction	12,679	18,462	5,783	7%
Manufacturing	44,871	56,754	11,883	21%
Transportation, Communication and Utilities	8,185	9,516	2,434	4%
Wholesale Trade	16,128	22,508	6,380	8%
Retail Trade	31,054	43,132	12,078	16%
Finance, Insurance and Real Estate	13,131	22,340	9,209	8%
Services	46,293	76,265	29,979	28%
Government and Government Enterprises	13,994	17,059	3,065	7%
Other	2,135	3,749	1,614	1%

Notes: Services include Business, Repair, Personal, Entertainment, Recreation, Health, Education, Accommodation and Food, Social, and Professional services. Government and Government Enterprises includes all non-military government agencies and enterprises, regardless of SIC code. Other includes agricultural services, forestry, commercial fishing, mining, and unclassified jobs.

Source: U.S Bureau of Economic Analysis and SEWRPC

Waukesha County has the third highest percentage of people with associate, bachelors, graduate, and professional degrees in Wisconsin (Table II-10). Over 41 percent of people 25 years of age and older have an associate, bachelors, graduate, or professional degree within Waukesha County. Only Dane with 49.5 percent and Ozaukee at 45.6 percent have higher percentages in Wisconsin. Within Waukesha County municipalities, this figure ranges from 18 percent in the Village of Butler to 70 percent in the Village of Chenequa (Table II-11). In the State of Wisconsin, 31 percent of residents age 25 and over have earned an associate, bachelors, graduate, or professional degree.

Table II-10

WAUKESHA COUNTY EDUCATIONAL ATTAINMENT FOR PERSONS 25 AND OVER: 2000

Attainment Level	Number	Percent
Less than 9 th Grade	5,537	2.3
High School, No Diploma	14,873	5.7
High School Graduate	66,651	27.6
Some College (No Degree)	54,483	22.6
Associate Degree	18,492	7.7
Bachelor's Degree	57,050	23.6
Graduate /Professional Degree	25,213	10.4
Total	241,299	100

Source: U.S. Bureau of the Census

Table II-11

RESIDENTS OF AGE 25 AND OVER WITH ASSOCIATES, BACHELOR'S, GRADUATE, OR PROFESSIONAL DEGREES BY COMMUNITY IN WAUKESHA COUNTY: 2000

Community	Number	Percent
Town of Brookfield	2,026	45.6
Town of Eagle	673	34.2
Town of Delafield	2,802	57.5
Town of Genesee	2,100	45.5
Town of Lisbon	2,149	28.3
Town of Merton	2,282	44.9
Town of Mukwonago	1,757	42.3
Town of Oconomowoc	1,957	38.8
Town of Ottawa	959	37.5
Town of Summit	1,355	40.2
Town of Vernon	1,428	30.1
Town of Waukesha	2,247	40.8
Village of Big Bend	228	28.1
Village of Butler	257	18.4
Village of Chenequa	291	70.4
Village of Dousman	287	27.2
Village of Eagle	309	26.9
Village of Elm Grove	3,058	69.1
Village of Hartland	2,028	40.9
Village of Lac La Belle	139	58.5
Village of Lannon	111	15.7
Village of Menomonee Falls	8,566	37.6
Village of Merton	451	37.4
Village of Mukwonago	1,381	35.0
Village of Nashotah	436	53.7
Village of North Prairie	370	36.6
Village of Oconomowoc Lake	244	61.6

Village of Pewaukee	2,227	38.3
Village of Sussex	2,012	36.2
Village of Wales	761	49.3
City of Brookfield	55.3	
City of Delafield	45.1	
City of Muskego	33.1	
City of New Berlin	44.0	
City of Oconomowoc	38.5	
City of Pewaukee	46.0	
City of Waukesha	37.6	

Source: U.S. Bureau of the Census

LAND USE

SEWRPC relies on two types of inventories and analyses in order to monitor urban growth and development in Southeastern Wisconsin—an urban growth ring analysis and a land use inventory. The urban growth ring analysis delineates the outer limits of concentrations of urban development and depicts the urbanization over the past 150 years. When related to urban population levels, the urban growth ring analysis provides a good basis for calculating urban population and household densities. By contrast, SEWRPC’s land use inventory is a more detailed inventory that places all land and water areas into one of 66 discrete land use categories, providing a basis for analyzing specific urban and non-urban land uses. Both the urban growth ring analysis and the land use inventory have been updated to the year 2000 under the continuing regional planning program, therefore serve as the basis for the land use trends present in this Plan.

Urban Growth Ring Analysis

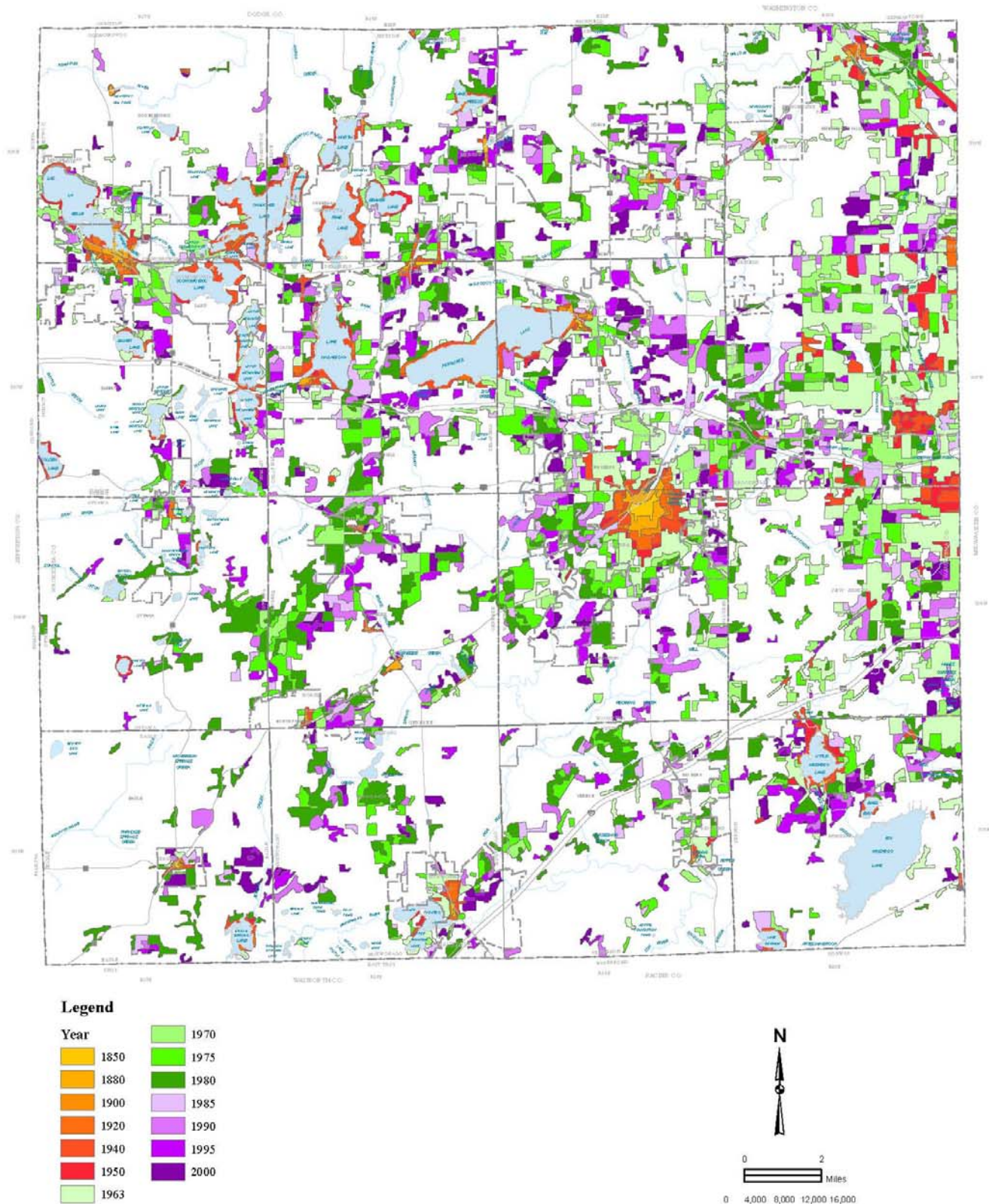
The urban growth ring analysis shows the historical pattern of urban settlement, growth, and development since 1850 for selected points in time. Areas identified as urban under this time series analysis include areas where residential structures or other buildings have been constructed in relatively compact groups, thereby indicating a concentration of residential, commercial, industrial, governmental, institutional, or other urban land uses. In addition, the identified urban areas encompass certain open space lands such as urban parks and small areas being preserved for resource conservation purposes within the urban areas.

As part of the urban growth ring analysis, urban growth for the years prior to 1940 was identified using a variety of sources, including the records of local historical societies, land subdivision plat records, farm plat maps, U. S Geological Survey maps, and Wisconsin Geological and Natural History Survey records. Urban growth for the years 1940, 1950, 1963, 1970, 1980, 1990, and 2000 was identified using aerial photographs. Because of limitations inherent in the source materials, information presented for the years prior to 1940 represents the extent of urban development at approximately those points in time, whereas the information presented for later years can be considered precisely representative of those respective points in time. The urban growth ring analysis, updated through 2000, is presented graphically on Map II-1.

Map II-1

HISTORIC GROWTH RING ANALYSIS IN WAUKESHA COUNTY: 1850-2000

Historic Urban Growth in Waukesha County: 1850-2000



Land Use Inventory

SEWRPC land use inventory is intended to serve as a relatively precise record of land use at selected points in time. The land use classification system used in the inventory consists of nine major categories which are divisible into 66 sub-categories, making the inventory suitable for both land use and transportation planning, adaptable to storm water drainage, public utility, and community facility planning, and compatible with other land use classification systems. Aerial photographs serve as the primary basis for identifying existing land use, augmented by field surveys as appropriate.

The first regional land use inventory was prepared by SEWRPC in 1963 and has been updated periodically following the preparation of new aerial photography, with the most recent inventory prepared using aerial photographs taken in spring of 2000. As part of the year 2000 land use inventory, the delineation of existing land use was referenced to real property boundary information not available in prior inventories. This change increases the precision of the land use inventory and makes it more useable to public agencies and private interests. As a result of this change, however, year 2000 land use inventory data are not strictly comparable with data from the 1990 and prior inventories. The data remains suitable for denoting general land use trends. The results of the year 2000 land use inventory are presented along with the results of prior land use inventories in Table II-12.

Table II-12

CHANGE IN LAND USE ACRES IN WAUKESHA COUNTY: 1963-2000

Land Use Category^a	1963	1970	1980	1990	2000
Urban					
Residential	28,148	35,476	50,745	59,247	75,221
Commercial	1,197	1,831	2,754	3,827	5,351
Industrial	924	1,758	2,747	3,802	5,525
Transportation, Communication, and Utilities	16,079	18,545	21,867	22,805	30,001
Governmental and Institutional	2,550	3,587	4,037	4,215	4,887
Recreational	3,311	4,605	5,756	6,465	8,253
Unused Urban Land	8,509	8,516	8,017	7,025	7,806
Subtotal Urban	60,718	74,318	95,923	107,386	137,044
Non-urban					
Natural Areas					
Surface Water	16,076	16,461	16,753	16,878	16,891
Wetlands	52,588	51,660	51,233	51,978	52,661
Woodlands	31,181	30,818	29,472	29,584	28,931
Subtotal Natural Areas	99,845	98,939	97,458	98,440	98,483
Agricultural	200,241	184,390	161,558	142,428	112,611
Unused Rural and Other Open Lands	10,786	13,943	16,651	23,336	23,397
Subtotal Nonurban	310,872	297,272	275,667	264,204	234,491
Total	371,590	371,590	371,590	371,590	371,535

Note: As part of the regional land use inventory for the year 2000, the delineation of existing land use was referenced to real property boundary information not available for the 1990 and prior inventories. This change increases the precision of the land use inventory and makes it more useable to public agencies and private interests throughout the Region. As a result of the change, however, year 2000 land use inventory data are not strictly comparable with data from the 1990 and prior inventories. At the county and regional level, the most significant effect of the change is to increase the transportation, communication, and utilities category—the result of the use of actual street and highway rights-of-way as part of the 2000 land use inventory, as opposed to the use of narrower estimated rights-of-way in prior inventories. This treatment of streets and

highways generally diminishes the area of adjacent land uses traversed by those streets and highways in the 2000 land use inventory relative to prior inventories.

Land Use Change: 1963-2000

Residential development was responsible for the most significant land use change within Waukesha County since 1963. Over 47,000 acres of land was converted to residential use as the county gained over 100,000 households between 1960 and 2000. Agricultural lands experienced the greatest loss of any land use within the county between 1963 and 2000. Nearly 88,000 acres of agricultural lands were converted to other land uses.

NATURAL RESOURCES

Groundwater Supply

The importance of groundwater as a source of water supply in Waukesha County and Southeastern Wisconsin can be shown by analyzing water-use data. According to estimates by the U.S. Geological Survey, water users in the Southeastern Wisconsin Region used about 324 million gallons per day (mgd) of water from surface and groundwater sources in 2000, not including water used for thermoelectric-power production. From this amount, 228 mgd, or about 70 percent, was withdrawn from surface water sources, primarily Lake Michigan; and 96 mgd, or about 30 percent, from groundwater (see Table II-13). In Waukesha County, nearly all of the water supply has historically been obtained from the groundwater system. This has recently changed somewhat with the conversion of the eastern portion of the Village of Menomonee Falls, the Village of Butler, and the eastern portion of the City of New Berlin to Lake Michigan water over the period of 1999 to 2005. Groundwater use and total water use in Waukesha County have risen steadily since 1985, increasing by about 36 percent over the period 1985 to 2000.

Table II-13

**TRENDS IN REPORTED SURFACE (SW) and GROUNDWATER (GW) USE IN SOUTHEASTERN WISCONSIN:
1979-2000
(IN MILLION GALLONS PER DAY)**

	1979			1985			1990			2000		
County Name	SW	GW	Total	SW	GW	Total	SW	GW	Total	SW	GW	Total
Kenosha	17.81	3.42	21.23	17.87	2.54	20.41	20.41	2.56	22.97	16.04	2.69	18.73
Milwaukee	172.47	10.18	182.65	213.26	9.91	223.17	184.96	6.17	191.13	183.22	6.32	189.54
Ozaukee	1.19	6.66	7.85	1.15	6.33	7.48	1.43	6.66	8.09	1.52	7.80	9.32
Racine	22.55	7.69	30.24	22.55	7.28	29.83	29.32	8.85	38.17	26.24	13.63	39.87
Walworth	0.14	9.89	10.03	1.16	9.14	10.30	0.08	16.07	16.15	0.07	14.95	15.02
Washington	0.15	10.11	10.26	0.06	9.37	9.43	0.08	9.76	9.84	0.08	13.30	13.38
Waukesha	0.02	33.37	33.39	0.12	27.84	27.96	0.04	30.78	30.82	0.35	37.56	37.91
Total	214.33	81.32	295.65	256.17	72.41	328.58	236.32	80.85	317.17	227.52	96.25	323.77
Percent of Total	72.5	27.5	100.0	78.0	22.0	100.0	74.5	25.5	100.0	70.3	29.7	100.0

Note: The trends are based on currently available data, but the sources of information and accuracy of data may vary from one reporting period to another. The USGS obtains most of water-use data from files of state agencies, and makes estimates for categories for which data are not reported (private domestic and agricultural uses). Water used for thermoelectric power is not included.

GW: Groundwater; SW: Surface Water

Source: SEWRPC and U. S. Geological Survey, 2000.

Recharge to groundwater is derived almost entirely from precipitation. Much of the groundwater in shallow aquifers originates from precipitation that has fallen and infiltrated within a radius of about 20 or more miles

from where it is found. The bedrock formations underlying the unconsolidated surficial deposits of Waukesha County consist of Precambrian crystalline rocks; Cambrian sandstone; Ordovician dolomite, sandstone, and shale; and Silurian dolomite. The uppermost bedrock unit throughout most of the county is pervious Silurian dolomite, primarily Niagara dolomite, underlaid by a relatively impervious layer of Maquoketa shale. In some of the pre-Pleistocene valleys in the southwestern and central portions of the county, however, the Niagara dolomite is absent and the uppermost bedrock unit is the Maquoketa shale.

The deeper sandstone aquifers are recharged by downward leakage of water through the Maquoketa Formation from the overlying aquifers or by infiltration of precipitation in western Waukesha County where the sandstone aquifer is not overlain by the Maquoketa Formation and is unconfined. On the average, precipitation annually brings about 32 inches of water to the surface area of the county. It is estimated that approximately 80 percent of that total is lost by evapotranspiration. Of the remaining water, part runs off in streams and part becomes groundwater. It is likely that the average annual groundwater recharge to shallow aquifers is 10 to 15 percent of annual precipitation.

To document the utilization of the shallow aquifers in the county, it may be assumed, for example, that, on the average, 10 percent of the annual precipitation reaches groundwater. Then, the average groundwater recharge in the County would be about 88 mgd. As previously noted, the estimated daily use of groundwater in 2000 was about 38 mgd, which is about 43 percent of the total amount of groundwater assumed to be recharged in a given year.

This indicates that there is an adequate annual groundwater recharge to satisfy water demands on the shallow aquifer system in Waukesha County on a countywide basis. However, the availability on a localized area basis will vary depending upon usage, pumping system configuration, and groundwater flow patterns.

The situation is different for the deep aquifers where withdrawals of groundwater cause supply/demand imbalance in areas of concentrated use of groundwater, which has resulted in the declining potentiometric surface and mining of groundwater. For example, Professor Douglas Cherkauer of the University of Wisconsin-Milwaukee, estimated that the demand on groundwater from the deep sandstone aquifer in Waukesha County is greater than the available supply (see Table II-14).

Table II-14

ESTIMATES OF AVAILABLE GROUNDWATER IN WAUKESHA COUNTY, 1999

Aquifer	Recharge Area (square miles)	Estimated Recharge Rate (inches per year)	Average Daily Recharge (mgd)	Average Daily Demand (mgd)
Shallow	400	3.1	59	3.5
Deep	100	3.1	14.8	31.5

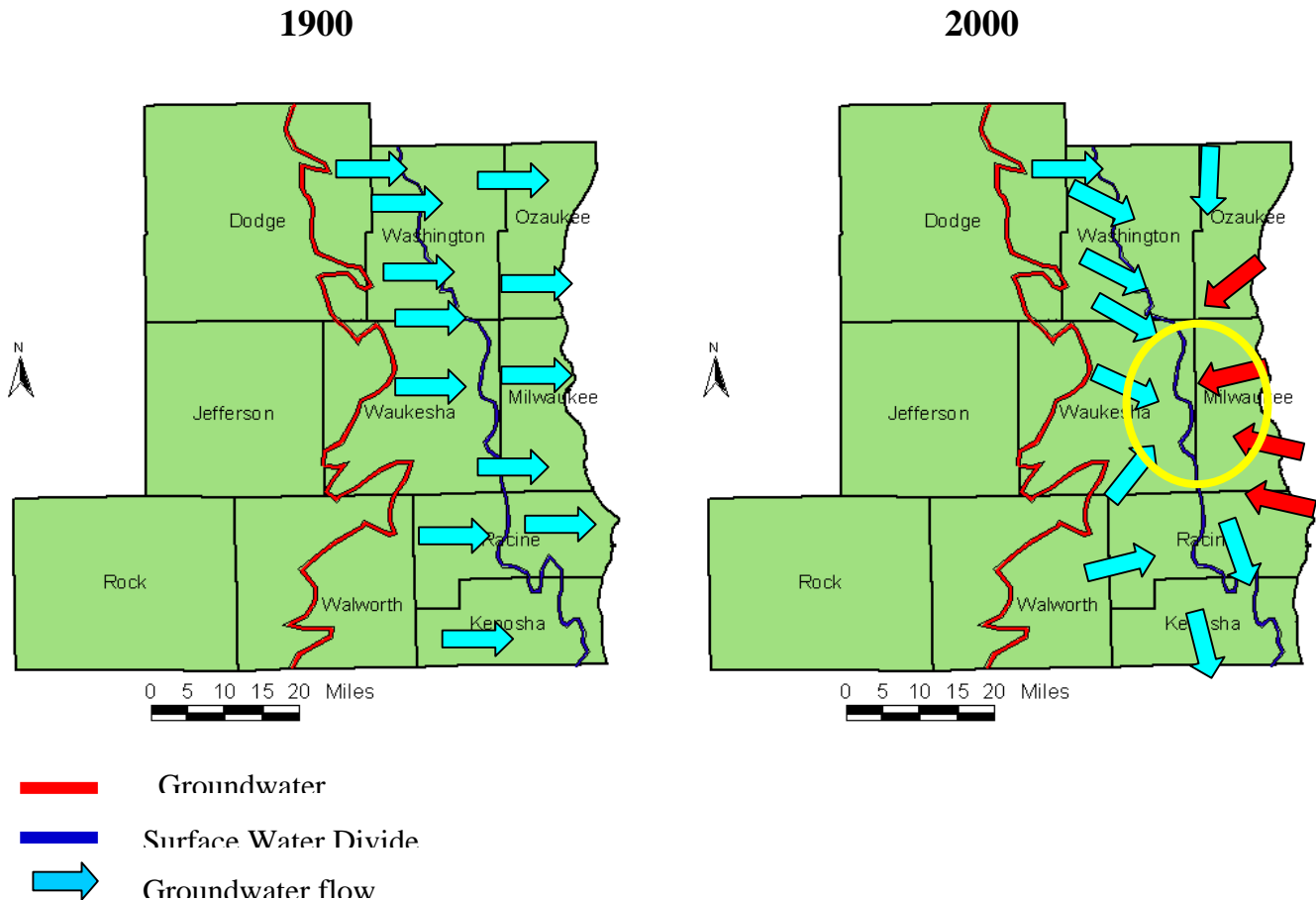
Note: mgd: million gallons per day

Source: D.S. Cherkauer, 1999

The imbalanced withdrawal of groundwater has shifted the major pumping center in Southeastern Wisconsin from the City of Milwaukee in the early 1900's to eastern Waukesha County in 2005. As a result of the groundwater use trend, the center of the "cone of depression", a term used to describe the deepest part of the pumping drawdown, has shifted westward about eight miles from Milwaukee to near eastern Waukesha County. Groundwater levels in the "cone of depression" have dropped about 500 feet since the onset of groundwater pumping. Figure II-1 shows how groundwater flows have been influenced as a result of groundwater pumping.

Figure II-1

SIMULATED GROUNDWATER FLOW DIRECTION ALTERATION FROM GROUNDWATER PUMPING



Source: SEWRPC

Surface Water Resources

Waukesha County has or contains portions of 33 lakes that comprise approximately 14,000 acres or almost 4 percent of the total area of the county. Surface water drains into the Fox, Rock, Root, and Menomonee River watersheds. The Menomonee and Root River watersheds lie east of the subcontinental divide and drain into the Great Lakes basin. The Fox and Rock Watersheds are west of the subcontinental divide and drain west into the Mississippi River basin.

FORMULATION OF OBJECTIVES

Planning may be described as a rational process for formulating and achieving objectives. The formulation of objectives is an essential task to be undertaken before plans can be prepared. This chapter presents a set of land use objectives along with supporting principles and related standards recommended by the Comprehensive Development Plan Advisory Committee as a basis for the preparation of a Waukesha County

Comprehensive Development Plan. The objectives are derived from the objectives contained in the Regional Land Use Plan for Southeastern Wisconsin: 2035.

The key steps in the comprehensive planning process are 1) formulation of objectives and standards, 2) inventory, 3) analyses and forecasts, 4) plan design, 5) plan evaluation, and 6) plan refinement and plan adoption. Plan implementation, although a step beyond the planning process, is considered throughout the process so that realization of the plan may be achieved.

The terms “objective,” “principle,” “standard,” “plan,” “policy,” and “program” are subject to a range of interpretations. Although this chapter deals with only the first three of these terms, an understanding of the interrelationship between the foregoing terms and the basic concepts which they represent is essential to any consideration of objectives, principles, and standards. Under the regional planning program, these terms have been defined as follows:

1. Objective: a goal or end toward the attainment of which plans and policies are directed.
2. Principle: a fundamental, primary, or generally accepted tenet used to support objectives and prepare standards and plans.
3. Standard: a criterion used as a basis of comparison to determine the adequacy of plan proposals to attain objectives.
4. Plan: a design that seeks to achieve agreed-upon objectives.
5. Policy: a rule or course of action used to ensure plan implementation.
6. Program: a coordinated series of policies and actions to carry out a plan.

The following general development objectives, presented as part of the year 2035 regional land use plan, have been reaffirmed by the Comprehensive Development Plan Advisory Committee for use in the preparation of the Waukesha County Comprehensive Development Plan; no ranking is implied by the order in which these objectives are listed:

1. Economic growth at a rate consistent with county resources, including land, water, labor, and capital, and primary dependence on free enterprise in order to provide needed employment opportunities for the expanding labor force.
2. A wide range of employment opportunities through a broad diversified economic base.
3. Preservation and protection of desirable existing residential, commercial, industrial, and agricultural development in order to maintain desirable social and economic values and renewal of obsolete and deteriorating areas in both urban and rural areas; and prevention of slums and blight.
4. A broad range of choice among housing designs, sizes, types, and costs, recognizing changing trends in age group composition, income, and family living habits.
5. An adequate, flexible, and balanced level of community services and facilities.
6. An efficient and equitable allocation of fiscal resources within the public sector of the economy.
7. An attractive and healthful physical and social environment with ample opportunities for high-quality education, cultural activities, and outdoor recreation.
8. Protection, sound use, and enhancement of the natural resource base.
9. Development of communities having distinctive individual character, based on physical conditions, historical factors, and local desires.

Within the framework established by the general development objectives, a secondary set of more specific objectives, which are directly relatable to physical development plans, and which can be at least crudely quantified has been developed. The specific development objectives are concerned primarily with spatial

allocation to, and distribution of, the various land uses; land use compatibility; resource protection; and accessibility.

The following specific development objectives have been formulated by the Comprehensive Development Plan Advisory Committee. No ranking is implied by the order in which these objectives are listed:

1. A balanced allocation of space to the various land use categories, which meets the social, physical, and economic needs of the county population.
2. A spatial distribution of the various land uses that will result in a convenient and compatible arrangement of land uses.
3. A spatial distribution of the various land uses which maintains biodiversity and which will result in the preservation and sustainable management of the natural resources of the County.
4. A spatial distribution of the various land uses which is properly related to the supporting transportation, utility, and public facility systems in order to assure the economical provision of transportation, utility, and public facility services.
5. The development and preservation of residential areas within a physical environment that is healthy, safe, convenient, and attractive.
6. The preservation, development, and redevelopment of a variety of suitable industrial and commercial sites both in terms of physical characteristics and location.
7. The conservation, renewal, and full use of existing urban service areas of the County.
8. The preservation of productive agricultural lands.
9. The preservation and provision of open space to enhance the total quality of the environment, maximize essential natural resource availability, give form and structure to urban development, and provide opportunities for a full range of outdoor recreational activities.

FORMULATION OF STANDARDS

Complementing each of the foregoing specific land use development objectives is a set of planning standards. Each set of standards is directly related to the objective. The standards facilitate application of the objectives in plan design and evaluation. The standards related to the nine specific land use objectives were developed by the subcommittee addressing the particular planning element. The following objective and standards serve as an example for industrial and commercial sites.

Objective

The preservation, development, and redevelopment of a variety of suitable industrial and commercial sites both in terms of physical characteristics and location.

Standards

1. Industrial, retail, and office uses should meet the following standards:
 - a. Available adequate water supply, sanitary sewer service, storm water drainage facilities, and power supply.
 - b. Ready access to the arterial street and highway system.
 - c. Adequate off-street parking and loading areas.
 - d. Provision of properly located points of ingress and egress appropriately controlled to prevent congestion on adjacent arterial streets.
 - e. Site design appropriately integrating the site with adjacent land uses.
 - f. Served by local transit service.

BALANCING OF PLANNING STANDARDS

In applying the planning standards and preparing the Waukesha County Comprehensive Development Plan, it should be recognized that it is unlikely that the Plan can meet all of the standards completely. It should also be recognized that some objectives are complementary, with the achievement of one objective supporting the achievement of others. Conversely, some objectives may be conflicting, requiring reconciliation through compromise.

For example, as part of the planning process, the objectives of preserving agricultural and other open space lands, must be balanced with the need to convert certain lands to urban use in support of the orderly growth and development of the County.

Most of the land use development objectives, principles, and standards were incorporated without significant change from the set of planning objectives, principles, and standards included in the adopted design year 2035 regional land use plan. This Chapter presents the general development objectives. Subsequent chapters contain the detailed planning principles and standards as they relate to the particular planning element.

PLANNING OBJECTIVES AND STANDARDS

Agricultural, Natural and Cultural Resources Objective No. 1

A spatial distribution of the various land uses which maintains biodiversity and which will result in the preservation and wise use of the natural resources of the County.

Agricultural, Natural and Cultural Resources Objective No. 2

The preservation of productive agricultural land.

Agricultural, Natural and Cultural Resources Objective No. 3

The preservation and provision of open space to enhance the total quality of the County environment, maximize essential natural resource availability, give form and structure to urban development, and provide opportunities for a full range of outdoor recreational activities.

Agricultural, Natural and Cultural Resources Objective No. 4

A spatial distribution of land uses and specific site development designs which protects or enhances the surface and ground water resources of the County

Note: This list will grow as other comprehensive plan chapters are completed.